

**U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM**

SCIENTIFIC NAME: *Astragalus cusickii* var. *packardiae*

COMMON NAME: Packard's milkvetch

LEAD REGION: Region 1

INFORMATION CURRENT AS OF: May 4, 2010

STATUS/ACTION

☐ Species assessment - determined we do not have sufficient information on file to support a proposal to list the species and, therefore, it was not elevated to Candidate status

☒ New candidate

☐ Continuing candidate

☒ Non-petitioned

☐ Petitioned - Date petition received:

☐ 90-day positive - FR date:

☐ 12-month warranted but precluded - FR date:

☐ Did the petition request a reclassification of a listed species?

FOR PETITIONED CANDIDATE SPECIES:

a. Is listing warranted (if yes, see summary of threats below)?

b. To date, has publication of a proposal to list been precluded by other higher priority listing actions?

c. If the answer to a. and b. is "yes", provide an explanation of why the action is precluded.

☐ Listing priority change

Former LP:

New LP:

Date when the species first became a Candidate (as currently defined): N/A

☐ Candidate removal: Former LPN:

☐ A – Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

☐ U – Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species.

☐ F – Range is no longer a U.S. territory.

- ___ I – Insufficient information exists on biological vulnerability and threats to support listing.
- ___ M – Taxon mistakenly included in past notice of review.
- ___ N – Taxon does not meet the Act’s definition of “species.”
- ___ X – Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Flowering plants, Fabaceae (Pea) Family.

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Idaho

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Idaho, Payette County

LAND OWNERSHIP: *Astragalus cusickii* var. *packardiae* (Packard’s milkvetch) is a narrow endemic plant that is only known from the northeastern corner of Payette County, about 15 miles (24 kilometer (km)) north of the town of Emmett and approximately 15 miles east of the town of Payette, in southwestern Idaho. Land ownership is composed of Bureau of Land Management (BLM), State, and private lands. Of the 26 confirmed *A. cusickii* var. *packardiae* occurrences, 17 (65 percent) are located on BLM land, 4 (15 percent) are located on State land, and 5 (19 percent) are located on privately owned land (Mancuso 2010, pp. 12, 14). The total acreage of occupied habitat cannot be accurately determined since acreage for 4 of the 26 occurrences (1 on BLM, 2 on State, and 1 on private) has not been measured. According to the information available, estimated acreages of occurrences are 10.5 acres (4.30 hectares (ha)) on BLM land, 0.2 acres (0.08 ha) on State land, and 3.3 acres (1.34 ha) on privately owned lands (Mancuso 2010, pp. 12, 14). BLM lands are managed by the Four Rivers Field Office, Boise District. State lands are managed by the Idaho Department of Lands. Private land includes several landowners.

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LEAD FIELD OFFICE CONTACT: Idaho Fish and Wildlife Office, Kendra Womack 208-685-6951, kendra_womack@fws.gov.

BIOLOGICAL INFORMATION

Species Description

Astragalus cusickii var. *packardiae* is an erect, perennial herb with multiple stems arising from a root crown. Plant height ranges up to approximately 35 cm (13.78 in). Plants are covered with whitish hairs that are pressed flat against the herbage giving it a dull green hue. Leaves have only a few small, well-spaced leaflets, or are reduced to a naked rachis (no leaflets). When leaflets are present, they are typically no more than about 1 mm (0.04 in) wide and 7 mm (0.28 in) long. Flowering stems have approximately 20 light-purplish flowers. The sepals (outer whorl of leaf-like structures surrounding the flower petals) have black hairs and are about 4 mm (0.16 in) long. The yellow-green fruit pods are pendulous (hanging), inflated, shiny, and

sometimes red-mottled (adapted from Barneby 1989, as described in Intermountain Flora, volume 3, part B, pp. 78-80; Mancuso 1999, p. 3; and Mancuso 2010, p. 1).

Taxonomy

Astragalus cusickii var. *packardiae* was first discovered in 1980 by botanists James Grimes and Dr. Patricia Packard (Mancuso 1999, p. 1). It was recognized as a new species in 1989 (Barneby 1989, as described in Intermountain Flora, volume 3, part B, p. 78) and named in honor of Dr. Packard. The U.S. Fish and Wildlife Service (Service) has reviewed the available taxonomic information cited above and we consider it to be a valid taxon.

Habitat/Life History

Astragalus cusickii var. *packardiae* is a narrow endemic plant that is only known from a sparsely populated portion of northeastern Payette County, approximately 15 miles (24 km) east of the town of Payette, in southwestern Idaho. Its entire known range, which lies between Big Willow Creek to the south and Little Willow Creek to the north, is only approximately 10 square miles (26 square kilometers (km²)) (Mancuso 2010, p. 1). The general landscape where *A. cusickii* var. *packardiae* occurs is characterized by rolling uplands and steep slopes that descend to terraced bottomlands of the main creeks or numerous minor tributaries in that area (Mancuso 1999, p. 7). Occurrences of *A. cusickii* var. *packardiae* are documented at elevations ranging from 2,600 to 3,000 feet (793 to 915 meters (m)) (Mancuso 1999, p. 7). Soils in the range of *A. cusickii* var. *packardiae* are classified as the Haw-Saralegui association, forming on very gently sloping to steep, deep, well-drained loams and coarse sandy loams on hilly dissected terraces (Rasmussen 1976 in Mancuso 2009, p. 2).

Astragalus cusickii var. *packardiae* plants are restricted to light-colored, sedimentary outcrops (Mancuso 2010, p. 1). Soils within these visually distinct outcrops are currently undescribed; however, they are composed of clayey to silty/sandy substrate and appear to possess physical or chemical soil properties (edaphic) that differ from adjacent soils (Mancuso 1999, p. 7; Mancuso 2009, p. 5). These outcrops are found scattered throughout the landscape but are limited in extent. The size of occupied outcrops ranges from less than 0.1 acre (less than 0.04 ha) to approximately 3 acres (1.2 ha) (Mancuso 2010, p. 1). Occupied outcrops occur on steep, south to west facing slopes (Mancuso 2009, p. 3). One of the characteristics of *A. cusickii* var. *packardiae* outcrops is that they are largely devoid of native shrubs, grasses, and forbs, with the exception of *A. cusickii* var. *packardiae*. Bare ground dominated the monitoring plots, ranging from approximately 52 to 89 percent (Mancuso 2009, p. 19; Mancuso 2010, p. 6). *A. cusickii* var. *packardiae* likely has adapted to the unique edaphic properties of these outcrops and consequently evolved with little competition from other native plants (Mancuso 2009, p. 5). Likewise, these unique edaphic conditions probably make the outcrops resistant to weed invasion (Mancuso 2009, pp. 20-21).

Vegetation within the range of *Astragalus cusickii* var. *packardiae* was originally sagebrush-steppe habitat composed of *Artemisia tridentata* (big sagebrush) in the overstory, with *Pseudoroegneria spicata* (bluebunch wheatgrass), *Festuca idahoensis* (Idaho fescue), and *Poa*

secunda (Sandberg bluegrass) representing important bunchgrass species (Mancuso 2009, p. 2). However, due to habitat impacts from a century of wildfires, livestock use, and invasive nonnative plant species, much of the area has been converted to annual grassland dominated by two non-native grass species, *Bromus tectorum* (cheatgrass), and *Taeniatherum caput-medusae* (medusahead). Shrub communities within *A. cusickii* var. *packardiae* habitat have largely been reduced to remnant patches with nonnative annual grass species dominating the understory, although native bunchgrasses are well represented in some of these patches (Mancuso 2009, p. 2).

Observations have documented that *Astragalus cusickii* var. *packardiae* reproduces by seed (Mancuso 1999, p. 10), with seasonal weather patterns influencing the onset of flowering. The peak flowering occurs in late May on average (Mancuso 1999, p. 10). Developing fruits and flowers typically occur on the same inflorescence, with seeds likely maturing in early summer (Mancuso 1999, p. 10). Information regarding the genetic diversity, germination, seed bank characteristics, or longevity of the species is currently unavailable. Small bees have been observed visiting flowers at several *A. cusickii* var. *packardiae* occurrences; however, pollination studies for this species have not been conducted (Mancuso 1999, p. 10). Likewise, seed predation has been documented on *A. cusickii* var. *packardiae* plants, although seed predation studies have not been conducted and seed predators are currently unknown (Mancuso 2010, p. 5).

Physical and Biological Factors (PBFs) Essential to the Species

Based on the best available scientific and commercial information, we have identified the PBFs essential to *Astragalus cusickii* var. *packardiae* to include: (1) areas with relatively undisturbed, sparsely vegetated (approximately 50 to 90 percent bare ground) sedimentary soil outcrops between 2,600 feet (700 m) and 3,000 feet (915 m) in elevation in northeastern Payette County; and (2) suitable insect pollinators and dispersal vectors for successful reproduction and dispersal. These PBFs are derived from the biological needs of *A. cusickii* var. *packardiae* as described in the preceding Habitat and Life History section. The PBFs include those habitat components essential to the species, including suitable host availability, seed bank storage, seed germination and seedling growth, flower production, pollination, seed set and fruit production, and genetic exchange. We acknowledge that specific information regarding the life history and biology of *A. cusickii* var. *packardiae* is lacking at this time.

Historical Distribution and Current Distribution

Astragalus cusickii var. *packardiae* was first discovered in 1980 in northeastern Payette County. Its entire known range is only approximately 10 square miles (26 km²) situated about 15 miles north of the town of Emmett and approximately 15 miles (24 km) east of the town of Payette, in southwestern Idaho. It is currently known from 26 occurrences ranging in size from less than 0.1 acre (0.04 ha) to approximately 3 acres (1.2 ha) (Mancuso 2010, p. 1). The distribution of *A. cusickii* var. *packardiae* follows a series of sedimentary outcrops exposed between Big Willow Creek on the south, Little Willow Creek on the north, the Dry Creek area to the east, and Stone Quarry Gulch to the west, an area roughly 6 miles (10 km) long by 2 miles (3 km) wide

(Mancuso 1999, p. 4). *Astragalus cusickii* var. *packardiae* was not discovered until 1980; therefore records contributing to historic range determination are limited. However, given its restricted geographic range and habitat requirements, it seems unlikely that additional, large occurrences will be discovered (Mancuso 2009, p. 7).

Most historical information known about *Astragalus cusickii* var. *packardiae* was collected during a 1999 field investigation by the Idaho Conservation Data Center (Mancuso 1999). This survey confirmed the species' limited distribution, small population size, and restricted habitat conditions. In 2008, the Service contracted with Mancuso Botanical Services to revisit and update information on previously documented *A. cusickii* var. *packardiae* occurrences and search for new occurrences. These extensive surveys located a few new occurrences, but did not result in a significant increase in its known range (Mancuso 2009). To identify survey locations, Michael Mancuso, Mancuso Botanical Services, used aerial photography from several sources to locate outcrops and potential habitat within the species' known range; the geographic extent of the surveys was limited to areas within approximately 10 miles (16 km) of the species' known range (M. Mancuso, pers. comm. 2010). Most outcrops with potential *A. cusickii* var. *packardiae* habitat on BLM and State lands have now been surveyed. A few small sedimentary outcrops on private and State lands, and a small parcel of BLM property north of Little Willow Creek may contain patches of habitat, although suitability appears to be marginal based on site floristics, occurrence of nonnative plants, size of the outcrops, and other attributes of the soils/substrates (Mancuso 2009, p. 6; M. Mancuso, pers. comm. 2010). With the exception of the Heart Gulch and Ringer Gulch areas on BLM land north of Little Willow Creek, future discovery of new occurrences at any of the abovementioned outcrops would not substantially add to the known range of *A. cusickii* var. *packardiae* (Mancuso 2009, p. 6).

Population Estimates/Status

The first systematic field survey for *Astragalus cusickii* var. *packardiae* was conducted in 1999. At that time total population size was estimated at 4,500 plants located within 20 occurrences on BLM, State, and private land (Mancuso 1999, pp. 1, 10). In 2008, the Service contracted with Mancuso Botanical Services to conduct additional surveys and map new populations of *A. cusickii* var. *packardiae*; as well as develop and establish a monitoring program for this species (see *Monitoring* below) (Mancuso 2009; Mancuso 2010). In 2008, surveys of more than 50 outcrops detected a total of 6 new occurrences, supporting approximately 860 *A. cusickii* var. *packardiae* plants (Mancuso 2009, p. 3). The entire population of *A. cusickii* var. *packardiae* is currently estimated at approximately 5,000 plants located within 26 occurrences; abundance ranges from 3 to approximately 500 plants per occurrence (Mancuso 2010, p. 1). *Astragalus cusickii* var. *packardiae* abundance data is collected as part of the monitoring program described below in the *Monitoring* section; however, plant abundance trends cannot be determined at this time because only 2 years of monitoring data are available.

NatureServe has currently given *Astragalus cusickii* var. *packardiae* a conservation status rank of G5T1: critically imperiled subspecies of an otherwise widespread and common species. This species also has a National and State of Idaho status rank of 1: critically imperiled in the jurisdiction because of extreme rarity or because of some factor(s) such as very steep declines

making it especially vulnerable to extirpation from jurisdiction (NatureServe 2010). It is also categorized as a globally imperiled/high endangerment special status plant species by the Idaho BLM. Based on this information, as well as the survey data presented above, we consider *A. cusickii* var. *packardiae* to be one of the rarest plants in Idaho.

Monitoring

In addition to the *Astragalus cusickii* var. *packardiae* surveys conducted in 2008, the Service contracted with Mancuso Botanical Services to establish an ongoing monitoring program for this species (Mancuso 2009; Mancuso 2010). The objectives of the monitoring are to collect quantitative information regarding: (1) *A. cusickii* var. *packardiae* abundance and basic demographic attributes, (2) plant community composition, and (3) ground disturbance factors (Mancuso 2009, p. 14). One of the goals of the monitoring design is to have a monitoring plot established at all 21 *A. cusickii* var. *packardiae* occurrences located on BLM and State land (Mancuso 2010, p. 6). Sixteen plots were established and monitored in 2008. In 2009, monitoring was conducted in 19 plots, including the 16 original plots established in 2008 and 3 additional plots established in 2009 (Mancuso 2010, p. 4). Seventeen of the plots are located on BLM land and 2 are located on State land. Monitoring plots have not yet been set up at the remaining 2 occurrences on State land due to access issues. If access issues can be resolved these remaining 2 plots will be established in 2010 (Mancuso 2010, p. 6).

Results are discussed below under the *Threats* section.

THREATS

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

Several threat factors are contributing to the destruction, modification, or curtailment of *Astragalus cusickii* var. *packardiae*'s habitat or range. The most obvious and imminent threat to the species is disturbance from off-road vehicles (ORVs). Other primary threats include the increased frequency of wildfire and invasion of nonnative annual species, such as *Bromus tectorum*. Livestock use is also a potential concern primarily through direct damage to the plants. Although threats are occurring on all land ownerships (BLM, State, and private) within the range of *A. cusickii* var. *packardiae*, monitoring results discussed below reflect data collected on BLM and State land (see *Monitoring* section above) where 21 of the 26 occurrences are found.

Recreation (Off-road vehicle use)

The primary recreational activity currently affecting *Astragalus cusickii* var. *packardiae* and its habitat is the use of ORVs. ORV use is detrimental to native plants and the habitats they rely on by crushing and uprooting plants (potentially resulting in injury or mortality); through mechanical disturbance of the soil, which can lead to accelerated erosion, altered hydrologic patterns, and soil compaction (potentially inhibiting seed germination); and by serving as a vector for the spread of invasive nonnative plant species (Stokowski and LaPoint 2000; Mancuso

2009, p. 20).

Surveys in 1999 did not identify ORV use as a threat to *Astragalus cusickii* var. *packardiae* or its habitat (Mancuso 2009, p. 6; Mancuso 1999, pp. 11-13). Monitoring since 2008 has documented a significant increase in ORV activity within *A. cusickii* var. *packardiae* occurrences impacting its habitat (Mancuso 2009, p. 6; Mancuso 2010, p. 6). One contributing factor for the increase in ORV use within *A. cusickii* var. *packardiae* occurrences may be that Clay Peak Motorcycle Park, a heavily used ORV recreational area located 15 miles (24 km) west of occupied habitat, was transferred from public to private management in 2007 and eventually closed. With the close of the Clay Peak Motorcycle Park a substantial amount of ORV use shifted onto nearby public lands and into the range of *A. cusickii* var. *packardiae* (BLM, in litt. 2010a). In addition, the rolling terrain, steep slopes, and relatively sparse vegetation make this area, which includes *A. cusickii* var. *packardiae* habitat, an attractive hill climb area for ORV users.

ORVs are traveling directly through outcrops occupied by *Astragalus cusickii* var. *packardiae*, as well as along the rims, spur ridges, and slope bases that form the margins of the occupied outcrops (Mancuso 2009, p. 6). Tracks range from single passage treads to major hill climbing runways (Mancuso 2010, p. 8). In 2009, 11 of the monitoring plots (58 percent) had ORV tracks occurring within them (Mancuso 2010, p. 6). In total, 67 tracks were recorded in 2009; 40 (60 percent) of these tracks were not present in 2008 (Mancuso 2010, p. 6). From these data it appears that ORV disturbance within *A. cusickii* var. *packardiae* habitat is increasing (Mancuso 2010, p. 6). In response to widespread ORV use and its apparent expansion in 2009, Service representatives accompanied Michael Mancuso on a site visit to *A. cusickii* var. *packardiae* habitat on February 8, 2010. One of the stops was to a monitoring plot (4-1) that did not have ORV tracks recorded in either 2008 or 2009. However, during the 2010 site visit several recent ORV passes were evident adjacent to this plot (Service, in litt. 2010). In addition to the tracks at this site, extensive ORV tracks throughout the *A. cusickii* var. *packardiae* habitat on State, Federal, and privately owned lands were observed.

ORV use through occupied outcrops has resulted in the crushing of *Astragalus cusickii* var. *packardiae* plants (Mancuso 2009, p. 6). In addition, ORVs are disturbing soils. Soils within the sedimentary outcrops where *A. cusickii* var. *packardiae* occurs are made up of fine, loose substrate, and are typically located on steep, relatively sparsely vegetated slopes, making them prone to accelerated erosion. Natural water erosion appears to be affecting the slopes occupied by *A. cusickii* var. *packardiae*. Water rivulet channels were observed exposing roots or smothering foliage with sediment debris on several *A. cusickii* var. *packardiae* plants in 2008 (Mancuso 2009, p. 20) and were a relatively common ground disturbance at several plots in 2009 (Mancuso 2010, p. 8). Because of the erosive nature of these soils, the extensive ORV use within *A. cusickii* var. *packardiae* habitat is exacerbating erosion of naturally occurring water rivulets (Mancuso 2010, p. 8) and forming additional “user created” channels. The subsequent accelerated erosion causes soil loss, substrate destabilization, and soil compaction, which can lead to increased root exposure, smothering of *A. cusickii* var. *packardiae* plants, and poor seed germination. ORV created tracks can also contribute to a change in species composition by not only introducing invasive nonnative plant species, such as *Bromus tectorum* to the outcrops, but also by creating microsites more favorable to the establishment of these species (see *Wildfire and*

Invasive Nonnative Annual Grasses below).

Given the on-going and increasing use of ORVs and their effects on *Astragalus cusickii* var. *packardiae* and its associated habitat, the Service believes that continued ORV use within the range of *A. cusickii* var. *packardiae* is a serious and imminent threat to this species that will result in continued destruction of individual plants and further degradation of *A. cusickii* var. *packardiae* habitat.

Wildfire regime and invasive nonnative annual grasses

The general landscape where *Astragalus cusickii* var. *packardiae* occurs was originally dominated by sagebrush-steppe vegetation (Idaho Department of Environmental Quality 2008 in Mancuso 2009, p. 2). However, due to the impacts of multiple threats, including the invasion of nonnative annual grasses and increased frequency of fire, much of this area has been converted to annual grassland dominated by two nonnative grass species, *Bromus tectorum* and *Taeniatherum caput-medusae*. The Service is aware of 3 recent wildfires within *A. cusickii* var. *packardiae* habitat, one in 1986 which burned a total of 53,000 acres; another in 1992, which burned 1,700 acres; and most recently, a wildfire in 2008 that burned the edges of *A. cusickii* var. *packardiae* habitat at monitoring plot 4-1 (Jonathan Beck, Boise District BLM, pers. comm. 2010b; Mancuso 2010, p. 8). A portion of the 1986 fire was reseeded; however, the actual seed mix used is unknown. Post-fire rehabilitation did not occur after the 1992 fire and it is unknown if seeding or planting occurred after the 2008 fire (Beck pers. comm. 2010b). As a result of these fires, native shrub communities have been reduced to remnant patches (Mancuso 2009, p. 2) and only isolated pockets of *Artemisia tridentata* and *Ericameria* sp. (rabbitbrush) remain throughout the approximately 10 square mile (26 km²) area where *A. cusickii* var. *packardiae* is known to occur (BLM, in litt. 2010a).

Our specific understanding of the historical wildfire regime within *Astragalus cusickii* var. *packardiae* habitat is limited. However, prior to the establishment of annual nonnative invasive grasses in the region, the open habitat occupied by *A. cusickii* var. *packardiae* was not predisposed to burn. Annual grasslands that now dominate the vegetation, which are partially a result of the 3 wildfires that have occurred in the area since 1986, have changed the fire ecology of sagebrush-steppe habitats within the range of *A. cusickii* var. *packardiae* (Whisenant 1990). Fire was historically infrequent in the desert shrublands of the Great Basin. The native plant communities did not provide significant fine fuels, and large scale wildfires were likely infrequent (Baker, in press. pp. 1). Fires were more typically restricted to relatively small, isolated patches (Brookes and Pyke 2001, p. 5; Whisenant 1990, pp. 4, 6).

Conversely, the widespread invasion of nonnative plant species, particularly annual grasses such as *Bromus tectorum* and *Taeniatherum caput-medusae*, has created a bed of continuous fine fuels that result in more frequent fires due to greater horizontal fuel continuity, increased fuel surface-to-volume ratio, and various properties that facilitate wildfire ignition and spread, such as lower moisture content and increased flammability (Whisenant 1990, pp. 6-7; Pellant 1996, p. 3 and references therein; Brooks *et al.* 2004a, p. 679). In addition, they leave few or no patches of unburned vegetation, which can inhibit the post-fire recovery of native sagebrush-steppe

vegetation by eliminating seed sources for regrowth of the native species (Whisenant 1990, p. 4; Pyke 2007). Because post-fire conditions are favorable for further invasion and establishment of nonnative annual grasses, invasive grasses soon dominate the community, leading to the establishment of an invasive grass-driven increase in the fire frequency cycle (Whisenant 1990, p. 4; Brooks and Pyke 2001, p. 5; D'Antonio and Vitousek 1992, pp. 73, 75; Brooks *et al.* 2004a, p. 678).

In general, the average wildfire return interval within the sagebrush-steppe ecosystem as a whole has been shortened from between 60 to 110 years, to the current frequency intervals of 5 years or less (Whisenant 1990, p. 4; Wright and Bailey 1982, p. 158; Billings 1990, pp. 308; USGS, in litt. 1999, pp. 1-9; West and Young 2000, p. 262). Climate change models also project a likely increase in fire frequency within the semiarid Great Basin region (see *Climate Change* under Factor E, below).

In addition to altering the historic wildfire regime, invasive nonnative plants can also negatively affect native plants through competitive exclusion, niche displacement, hybridization, and competition for pollinators; examples are widespread among native taxa and ecosystems (D'Antonio and Vitousek 1992, pp. 63-87; Olson 1999, p. 5; Mooney and Cleland 2001, p. 1). *Bromus tectorum* in particular appears to displace native plants by prolific seed production, early germination, and superior competitive abilities for the extraction of water and nutrients (Pellant 1996, pp. 3-4; Pyke 2007). In addition, *B. tectorum* apparently alters the soil environment such that it creates a positive feedback loop, enhancing the environment for its own growth and generating conditions conducive to further invasion (Pyke 2007).

One of the characteristics of *Astragalus cusickii* var. *packardiae* outcrops is that they are largely devoid of native shrubs, grasses, and forbs, with the exception of *A. cusickii* var. *packardiae*. Bare ground dominated the monitoring plots during 2008 and 2009 monitoring, ranging from 52 to 88 percent and 70 to 89 percent, respectively (Mancuso 2009, p. 19; Mancuso 2010, p. 6). *A. cusickii* var. *packardiae* likely has adapted to the unique edaphic properties of these outcrops and consequently evolved with little competition from other native plants (Mancuso 2009, p. 5). These unique edaphic conditions probably make the outcrops resistant to weed invasion (Mancuso 2009, pp. 20). However, field observation of outcrop segments burned in the past and now dominated by dense *Bromus tectorum* and/or *Taeniatherum caput-medusae* cover suggests this resistance can weaken, allowing weed invasions to occur (Mancuso 2009, p. 20-21). In addition, monitoring has shown *A. cusickii* var. *packardiae* to usually be absent from portions of outcrops that have burned and are dominated by dense, nonnative annual grass cover (Mancuso 2009, p. 6). These data indicate that by facilitating habitat degradation in the form of annual grass species invasion, wildfire is likely a threat to the long-term persistence of *A. cusickii* var. *packardiae* (Mancuso 2009, p. 6; Mancuso 1999, p. 12).

Astragalus cusickii var. *packardiae* plant community sampling recorded sparse invasive nonnative plant species cover at most occurrences even though photo monitoring shows nonnative annual grassland vegetation immediately adjacent to at least portions of each outcrop (Mancuso 2009, p. 20). However, in 2009, *Bromus tectorum* had the highest percent mean canopy cover (4.8 percent) of any herbaceous species in monitoring plots. *Taeniatherum caput-*

medusae followed with 1.6 mean percent canopy cover. *Bromus tectorum* was the only species recorded in all occurrences included in the monitoring program (19 total plots) and *T. caput-medusae* was found in all but 1 monitoring plot (Mancuso 2010, p. 6; M. Mancuso, pers. comm. 2010).

Studies have not been conducted on *Astragalus cusickii* var. *packardiae*'s response to wildfire, and the fire adaptability of this species is unknown. Post-fire data collected at plot 4-1 in 2009 indicated a reduction in *A. cusickii* var. *packardiae* abundance and shrub cover compared to pre-fire data collected in 2008 (Mancuso 2010, p. 6); however, future monitoring will help document the short- and long-term effects of the 2008 wildfire on *A. cusickii* var. *packardiae* at this monitoring plot.

Based on the information above, we consider the synergistic effects of nonnative annual grasses and wildfire to be a primary threat to *Astragalus cusickii* var. *packardiae* occurrences and its habitat. Invasive nonnative plants impact *A. cusickii* var. *packardiae* directly through competition, but also indirectly by providing continuous fine fuels that contribute to the increased frequency and extent of wildfires within the range of this species.

Livestock grazing

Impacts related to livestock use include trampling effects and/or consumption of plants (see *Disease or Predation* below), which could result in reduced reproductive success or direct mortality, and indirect impacts associated with habitat degradation, such as promoting the spread of noxious weeds and invasive nonnative plants (Milchunas and Lauenroth, 1993, pp. 327-366; Jones 2000, pp. 155-164). Currently, there are 3 grazing allotments within the range of *Astragalus cusickii* var. *packardiae*: Little Willow, Bannister Basin, and Paddock Valley (Beck, pers. comm. 2010a). These are spring and summer allotments, which are grazed from April to June by both cattle and sheep (BLM, in. litt. 2010a). The Service has no information on livestock use within *A. cusickii* var. *packardiae* habitat on State or private land.

There has been no research specific to *Astragalus cusickii* var. *packardiae* to assess the effects of livestock use and baseline pre-livestock population estimates for *A. cusickii* var. *packardiae* are not available, making it difficult to assess the effects from livestock use over time. However, trampling of plants and general ground disturbance by livestock is recorded as part of the *A. cusickii* var. *packardiae* monitoring protocol (Mancuso 2009, pp. 16-17). Tracks that cannot be identified with certainty are recorded as "unknown animal tracks"; however, Mancuso (2010, p. 7) reported that in 2008 and 2009, tracks identified as unknown "were almost certainly from cattle in nearly all cases." Unknown animal tracks accounted for approximately half of the mean total ground disturbance recorded in 2009 and exceeded 5 percent ground cover in 38 percent of the monitoring plots (Mancuso 2008, p. 6). This disturbance factor was the most common disturbance recorded in both 2008 and 2009 (Mancuso 2010, p. 7). Mean ground disturbance recorded for cattle tracks was similar for 2008 and 2009 (0.4 and 0.5 percent, respectively) (Mancuso 2010, p. 16). Although domestic sheep use occurs within the range of *A. cusickii* var. *packardiae* and sheep feces was recorded in several of the monitoring plots, no tracks clearly caused by sheep were recorded in 2009 (Mancuso 2010, pp. 6, 17).

In both 2008 and 2009, track depths of 1 inch (2.5 cm) or more were recorded at several plots, which indicates at least some of the tracks were made during wet soil conditions (Mancuso 2010, p. 7). Although cattle tracks tend to be concentrated along the margins and less steep portions of occupied outcrops, monitoring has documented *Astragalus cusickii* var. *packardiae* plants crushed by cattle trampling (Mancuso 2010, p. 7). In addition to direct impacts to individual plants from trampling, livestock can indirectly impact *A. cusickii* var. *packardiae* habitat through mechanical disturbance of the soil. Because of the erosive nature of the soils occupied by *A. cusickii* var. *packardiae*, mechanical disturbance can contribute to substrate destabilization, soil loss, and soil compaction, which can lead to increased root exposure, smothering of *A. cusickii* var. *packardiae* plants, and poor seed germination. Persistent tracks within the outcrops also appear to be microsites more favorable to *Bromus tectorum* establishment compared to adjacent undisturbed soils (Mancuso 2010, p. 7).

Factor A Summary

Based on our evaluation of the on-going threats from ORV use, wildfire, invasive nonnative plants, and livestock, we conclude that this species is threatened by the present and threatened destruction, modification, or curtailment of its habitat and range.

B. Overutilization for commercial, recreational, scientific, or educational purposes.

We are not aware of any threats involving the overutilization or collection of *Astragalus cusickii* var. *packardiae* for any commercial, recreational, scientific, or educational purposes at this time.

C. Disease or predation.

We do not have information to indicate that disease poses a significant threat to *Astragalus cusickii* var. *packardiae*; however, surveys did identify exfoliated green stem tissue and exposure of yellowish subdermal tissue on approximately 4 percent of the *A. cusickii* var. *packardiae* plants surveyed in 2009 (Mancuso 2010, p. 5). Mancuso (2010, p. 5) speculated that it could have been the result of an unidentified insect, or perhaps a fungal organism; however, the causative agent was not verified.

Monitoring in 2009 detected seed predation on 59 percent of the reproductive *Astragalus cusickii* var. *packardiae* plants sampled, including 25 percent of all seed pods (Mancuso 2010, p. 5). This is a large increase in seed predation compared to 2008, which only reported seed predation on 4 percent of the reproductive plants sampled (Mancuso 2009, p. 18). Seed predation studies have not been conducted and specific *A. cusickii* var. *packardiae* seed predators are currently unknown.

Livestock use by cattle and sheep occurs within *Astragalus cusickii* var. *packardiae* habitat (BLM, in. litt. 2010a). Herbivory by cattle has been documented previously, and some herbivory by sheep appeared likely (Mancuso 1999, p. 11). In 2009, herbivory was recorded on only 10 of the 177 *A. cusickii* var. *packardiae* plants sampled and appeared to be from cattle (Mancuso

2008, p. 5). This level of herbivory was similar to that recorded in 2008 (Mancuso 2010, p. i).
Factor C Summary

Based on the best available information, very little herbivory by wildlife or livestock has been observed or documented. A large increase in seed predation was recorded from 2008 to 2009, posing a potential threat to *Astragalus cusickii* var. *packardiae*, but information about how this affects *A. cusickii* var. *packardiae* is limited. At this time, we do not consider *A. cusickii* var. *packardiae* to be threatened by disease or predation.

D. The inadequacy of existing regulatory mechanisms.

Federal

Sixty-five percent of the known *Astragalus cusickii* var. *packardiae* occurrences are on BLM administered lands, located entirely within the Boise District, Four Rivers Field Office. *A. cusickii* var. *packardiae* is categorized as a Type 2 special status species by the Idaho BLM. This ranking indicates that it is a Rangewide/Globally Imperiled Species with High Endangerment, which are species that are experiencing significant declines throughout their range with a high likelihood of being listed in the foreseeable future due to their rarity and/or significant endangerment factors.

Management of BLM lands where *Astragalus cusickii* var. *packardiae* occurs is currently covered under the Cascade Resource Management Plan (RMP), which was finalized on July 1, 1988 (BLM, in. litt. 1988). RMPs are the basic land use documents that guide land use decisions and management actions on BLM administered land through establishing goals and objectives and the measures needed for accomplishing these goals and objectives (BLM, in. litt. 2008). In 2008, the BLM Four Rivers Field Office initiated development of a new RMP and associated environmental impact statement (EIS) for the Four Rivers planning area (BLM, in. litt. 2008). It is anticipated that a draft EIS for the new RMP will be released sometime in 2010 (BLM, in. litt. 2009).

Currently, the range of *Astragalus cusickii* var. *packardiae* under BLM's authority is grazed during spring and/or summer under three different allotments: Little Willow, Bannister Basin, and Paddock Valley (BLM, in. litt. 2010a). The BLM uses "Idaho Standards for Rangeland Health and Guidelines for Grazing Management" to provide resource measures and guidance for healthy, functional rangelands. These standards only apply to management of livestock use. Under BLM's regulations, the agency has to revise its grazing management if it determines that its existing management is not appropriate to ensure that these standards and guidelines will be met (USDI, 1997). If met, we believe the rangeland health standards (particularly standards 1 (watersheds), 4 (native plant communities), and 8 (rare species) (BLM 1997, pp. 6) would likely address the conservation needs of the species as they relate to livestock use. However, the Service does not have information on how standards or guidelines for grazing are currently being met in these allotments.

Within *Astragalus cusickii* var. *packardiae*'s range, some areas are open to ORV use (ride anywhere), and in some areas ORV use is limited to existing/designated roads and trails (BLM, in. litt. 1986). We believe these existing regulations are not adequate to protect *A. cusickii* var. *packardiae* and its habitat. In areas that are open to ORV use, unregulated impacts to this plant species and its habitat are occurring (see Factor A discussion of the effects of ORV use). In addition, in the area where ORV use is designated as limited, recreational use is currently not being enforced through fencing, signage or legal enforcement.

No special management for *Astragalus cusickii* var. *packardiae* was identified in the 1988 RMP (*A. cusickii* var. *packardiae* was not recognized as a new species until 1989), although the RMP does designate a portion of the *A. cusickii* var. *packardiae* range as limited to existing/designated roads and trails for ORV use (BLM, in. litt. 1986). In the new, draft RMP, the Four Rivers Field Office is proposing that the majority of the *A. cusickii* var. *packardiae* habitat that occurs on BLM land be designated as the Bannister Basin Area of Critical Environmental Concern (ACEC), citing habitat degradation from ORV use as the factor influencing management attention (BLM, in. litt. 2010a). This 3,548 acre (1,436 ha) ACEC is currently proposed in 2 (A and D) of the 4 EIS alternatives (Beck, pers. comm. 2010a, map). The designation of an ACEC highlights areas where special management attention is needed to protect and prevent irreparable damage to important historic, cultural and scenic values; fish, wildlife resources or other natural systems or processes; or to protect human life and safety from natural hazards (BLM, in. litt. 2010b). Specific management prescriptions identified for the proposed Bannister Basin ACEC include, but are not limited to, closing the area to off-road use and restricting livestock grazing to fall use only (BLM, in. litt. 2010a). However, because the RMP is still in draft form and an alternative has not been chosen, there is no guarantee that the designation of this ACEC will be included in the final RMP.

Monitoring information collected the last 2 years on BLM land indicates that existing regulations are not currently protecting *Astragalus cusickii* var. *packardiae* habitat or individual plants from harm. In fact, data has shown that ORV use is increasing in *A. cusickii* var. *packardiae* habitat, plants have been crushed, and soils are being eroded. In addition, as the BLM has not yet completed the analysis of alternatives and released the draft EIS for public comment, we are not certain that an ACEC to protect the species will be designated and implemented. Therefore, we cannot at this time consider the proposed protections from the RMP.

State

Fifteen percent of *Astragalus cusickii* var. *packardiae* occurrences are located on State owned lands. State lands within the range of *A. cusickii* var. *packardiae* are managed by the Idaho Department of Lands (IDL) as endowment assets of the State of Idaho. Endowment lands are managed "in such manner as will secure the maximum long-term financial return" to the trust beneficiaries (IDL 2007, p. 3). Endowment land management goals include: (1) protect and enhance the value and productivity of the land assets; (2) maximize financial returns from land assets over time; (3) encourage a diversity of revenue-producing uses of land assets; and (4) manage land assets prudently, efficiently, and with accountability to the beneficiaries (IDL 2007, p. 16). Monitoring data indicate that impacts within *A. cusickii* var. *packardiae* habitat are

occurring on state land. On IDL lands, recreation users are supposed to stay on existing trails or roads, but there is no inventory of existing trails, and no significant enforcement of OHV use in this area (Dean Johnson, IDL, pers. comm. 2010). We do not have specific information regarding livestock use on State lands where the *A. cusickii* var. *packardiae* occurrences are located.

Astragalus cusickii var. *packardiae* is ranked S1 by the State of Idaho Natural Heritage Program, indicating that it is critically imperiled because of extreme rarity or because some factor of its biology makes it especially vulnerable to extinction. However, the State Heritage Program rankings are not legal designations and do not confer State regulatory protection to this species.

Private

We are unaware of any protections specific to *Astragalus cusickii* var. *packardiae* on private lands. However, we do know that some landowners in the area oppose ORV-user access on their private lands.

Factor D Summary

Regulatory mechanisms to protect *Astragalus cusickii* var. *packardiae* and its habitat are not adequate. Designation as a BLM special status species and the ORV restrictions that are inadequate in some areas and not enforced in others, are not providing protection on lands managed by the BLM. In addition, regulatory mechanisms to protect *A. cusickii* var. *packardiae* are not in place for State of Idaho lands. Although conservation measures have been proposed in the draft BLM RMP, there is no certainty that these measures will be implemented or will effectively conserve *A. cusickii* var. *packardiae* on BLM lands. Therefore, we conclude the species is threatened by the inadequacy of existing regulatory mechanisms.

E. Other natural or manmade factors affecting the species' continued existence.

Fragmentation

In addition to the habitat degradation and fragmentation resulting from the threat factors described above, *Astragalus cusickii* var. *packardiae* habitat is somewhat naturally fragmented due to its occupancy of small and scattered outcrops.

Studies specific to *Astragalus cusickii* var. *packardiae* pollinators, genetic diversity, or germination have not been conducted. Although specific pollinators are unknown, the presence of small bees on *A. cusickii* var. *packardiae* plants at several occurrences suggests this species is insect-pollinated (Mancuso 1999, p. 10). Therefore, providing suitable habitats and foraging habitats for the species' insect pollinators is likely important for maintaining *A. cusickii* var. *packardiae* genetic diversity. Studies in other plant species have shown that small populations are vulnerable to relatively minor environmental disturbances such as wildfire and nonnative plant invasions (Given 1994, pp. 15-16), and are subject to the loss of genetic diversity from genetic drift and inbreeding (Ellstrand and Elam 1993, pp. 217-237). Populations with lowered

genetic diversity are more prone to local extinction (Barrett and Kohn 1991, p. 4); smaller populations generally have lower genetic diversity, and lower genetic diversity may in turn lead to even smaller populations by decreasing the species' ability to adapt, thereby increasing the probability of population extinction (Newman and Pilson 1997, p. 360).

Climate Change

Climate change effects to *Astragalus cusickii* var. *packardiae* habitats are unknown at this time, although large-scale climate modeling indicates that changes to precipitation and temperatures will likely increase suitability for *Bromus tectorum* and wildfire (Bradley et al., in press, p. 5). Endemic species that have limited ranges and are adapted to localized conditions, such as this species, are expected to be more severely impacted by climate change (Midgley et al. 2002, p. 448).

Factor E Summary

Based on the best available scientific and commercial information on other natural or manmade factors affecting the continued existence of *Astragalus cusickii* var. *packardiae*, we do not consider *A. cusickii* var. *packardiae* to be threatened by natural fragmentation or climate change at this time.

CONSERVATION MEASURES PLANNED OR IMPLEMENTED

No formal conservation agreements have been initiated for *Astragalus cusickii* var. *packardiae*. The Service has supported and funded surveys to locate and delineate occurrences and document the extent and distribution of *A. cusickii* var. *packardiae*. In addition, the Service initiated a long-term monitoring program to collect quantitative information regarding (1) *A. cusickii* var. *packardiae* abundance and basic demographic attributes, (2) plant community composition, and (3) ground disturbance factors (Mancuso 2009 p. 14). In 2010, the Service has met with the BLM on at least 2 occasions to update them on ongoing monitoring efforts, and to express concern about the status of this species and the need for additional conservation measures.

The current BLM RMP for the Four Rivers planning area, which was finalized in 1988, provides no specific protection for *Astragalus cusickii* var. *packardiae*. However, the RMP does designate a portion of the *A. cusickii* var. *packardiae* range as limited to existing/designated roads and trails (BLM, in. litt. 1986), although this designation is currently not controlled or minimized through fencing, signage or enforcement.

The Four Rivers Field Office is in the process of developing a new RMP and is currently proposing to designate the majority of *Astragalus cusickii* var. *packardiae* habitat as the Bannister Basin ACEC in 2 of the 4 EIS alternatives (BLM, in. litt. 2010a, map). The primary objective of the proposed ACEC is to better protect *A. cusickii* var. *packardiae* populations and its related habitat requirements and to prevent further destruction. Proposed management prescriptions associated with the Bannister Basin ACEC include, but are not limited to, no ORV

use, motorized vehicles restricted to designated roads, and grazing by livestock permitted in the fall only. However, this designation has not yet been adopted.

The Service is unaware of any other conservation measures planned or implemented for *Astragalus cusickii* var. *packardiae* and its habitat.

SUMMARY OF THREATS (including reasons for addition or removal from candidacy, if appropriate)

Primary threats to *Astragalus cusickii* var. *packardiae* and its associated habitat include ORV use; invasive nonnative plants, specifically nonnative annual grasses such as *Bromus tectorum* and *Taeniatherum caput-medusae*; and wildfire. Livestock use is also a conservation concern.

According to monitoring conducted in 2009, all monitoring plots had ground disturbance from one or more factors (Mancuso 2010, p. 6). The most immediate threat to *Astragalus cusickii* var. *packardiae* and its habitat is ORV use. ORV use was not identified as a threat to this species during 1999 surveys, but by 2009 it had become a widespread activity, occurring throughout the limited range of *A. cusickii* var. *packardiae* (Mancuso 1999, pp. 11-13; Mancuso 2010, p. 6). ORV tracks have only been absent from 4 of 16 monitoring plots both consecutive years of monitoring (Mancuso 2010, p. 6). In total, 67 ORV tracks were recorded during 2009 monitoring; 40 (60 percent) of these tracks were not present in 2008 (Mancuso 2010, p. 6). Tracks range from single passage treads to major hill climbing runways and are present directly through *A. cusickii* var. *packardiae* occurrences, as well as along the rims, spur ridges, and slope bases that form the margins of outcrops occupied by *A. cusickii* var. *packardiae*. Accelerated erosion and mass wasting associated with ORV runways created by multiple hill climbing events are also evident on the steeper slopes. Damage to *A. cusickii* var. *packardiae* plants and its habitat through crushing of plants, soil erosion, and the introduction of invasive nonnative plant species by ORVs is a serious threat to *A. cusickii* var. *packardiae*. Although ORV use is restricted on BLM land in some portions of its range, unregulated use occurs throughout its habitat. To date, the Service considers this regulatory mechanism inadequate to protect *A. cusickii* var. *packardiae* from ORV use.

The potential for competition with invasive nonnative plant species occurs throughout the range of *Astragalus cusickii* var. *packardiae*. In addition, in the sage-steppe ecosystem, which includes the range of *A. cusickii* var. *packardiae*, wildfire appears to have increased in both frequency and extent over historical levels. Specifically within *A. cusickii* var. *packardiae* habitat, we know of 3 wildfires since 1986. We expect this trend to continue due to the projected effects of climate change, and the continued expansion of nonnative annual grasses. *A. cusickii* var. *packardiae* plant community sampling recorded sparse invasive nonnative plant species cover at most occurrences; however, in 2009 *Bromus tectorum* had the highest percent mean canopy cover (4.8 percent) of any herbaceous species in monitoring plots, followed by *Taeniatherum caput-medusae* (1.6 percent mean canopy cover). In addition, monitoring has shown *A. cusickii* var. *packardiae* to usually be absent from portions of outcrops that have burned and are dominated by dense, nonnative annual grassland cover (Mancuso 2009, p. 6), indicating that by promoting habitat degradation in the form of weedy grass species invasion, wildfire is likely a threat to the

long-term persistence of *A. cusickii* var. *packardiae* (Mancuso 2009, p. 6; Mancuso 1999, p. 12). Threats from wildfire and invasive nonnative plants are difficult to control, adding to their status as high ranking threats.

Livestock grazing by both cattle and sheep occurs within the range of *Astragalus cusickii* var. *packardiae*. Monitoring has documented *A. cusickii* var. *packardiae* plants crushed by cattle trampling, although cattle tracks tend to be concentrated along the margins and less steep portions of occupied outcrops (Mancuso 2010, p. 7). Persistent tracks within the outcrops also appear to be on microsites more favorable to *Bromus tectorum* establishment compared to adjacent undisturbed soils (Mancuso 2010, p. 7).

Astragalus cusickii var. *packardiae* is endemic to southwest Idaho within a limited geographical range that totals approximately 10 square miles (26 km²). Using the most recent survey estimates available for this species, there are approximately 5,000 individuals distributed in 26 occurrences on Federal, State and private lands (Mancuso 2010, p. 1). Small population size and limited distribution make this species particularly vulnerable to the many threats affecting its habitat (Given 1994, pp. 15-16; Newman and Pilson 1997, p. 360).

Conservation measures are being developed that could reduce the risks of some of the identified threats to this species on BLM lands. However, these measures are not yet finalized and we are not aware of when they may be adopted.

We find that *Astragalus cusickii* var. *packardiae* is warranted for listing throughout all its range; therefore, it is unnecessary to analyze whether it is threatened or endangered in a significant portion of its range.

For species that are being removed from candidate status:

___Is the removal based in whole or in part on one or more individual conservation efforts that you determined met the standards in the Policy for Evaluation of Conservation Efforts When Making Listing Decisions (PECE)?

RECOMMENDED CONSERVATION MEASURES

We recommend the following conservation measures for *Astragalus cusickii* var. *packardiae*:

1. Prohibit ORV Use. Immediate closure to ORV use of areas where *Astragalus cusickii* var. *packardiae* habitat occurs is necessary.
2. ACEC Designation. Support the designation and implementation of the Bannister Basin ACEC and its associated management guidelines in the proposed BLM, Four Rivers Field Office RMP. Implementation and enforcement of the management guidelines will be critical to the long-term protection of *Astragalus cusickii* var. *packardiae*.
3. Monitoring. Continue monitoring initiated in 2008 to better assess population trends and disturbance factors. Utilize this information to inform management decisions toward the conservation of this species.

4. Minimize Livestock Related Ground Disturbance. Support changes to the current grazing system in *Astragalus cusickii* var. *packardiae* habitat to minimize or prevent trampling and herbivory from livestock.
5. Further Survey Effort. Although most potential outcrops have been surveyed, Mancuso (2010) identified a few, small, unsurveyed outcrops with potential suitable habitat.
6. Habitat Restoration. Restore burned and degraded *Astragalus cusickii* var. *packardiae* occurrences and habitat. Immediate control of nonnative plant species and habitat rehabilitation using native plant species should be initiated within *A. cusickii* var. *packardiae* habitat to prevent further encroachment and to decrease wildfire frequency and intensity.
7. Protection from Fire. Prioritize fire response within *Astragalus cusickii* var. *packardiae* habitat.

These recommendations are for BLM and state lands. However, we also recommend working with willing private landowners to implement some of these conservation measures where appropriate and feasible.

LISTING PRIORITY

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	Imminent	Monotypic genus	1
		Species	2
		Subspecies/population	3*
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Rationale for listing priority number:

Magnitude:

Primary threats to *Astragalus cusickii* var. *packardiae* include inadequate regulation and enforcement of ORV use, invasion of nonnative species, increased wildfire frequency and intensity, and to a lesser degree livestock use. According to monitoring conducted in 2009, all monitoring plots had ground disturbance from one or more factors.

Of greatest immediate concern to *Astragalus cusickii* var. *packardiae* is ORV use. Based on monitoring data and field observations, ORV use is a serious threat to this species and its habitat rangewide and appears to be increasing in scope. ORV use is directly damaging *A. cusickii* var. *packardiae* plants and degrading its habitat. Although ORV use is limited in some portions of its range on BLM land, lack of enforcement is a problem. To date, the Service considers this regulatory mechanism inadequate to protect *A. cusickii* var. *packardiae* from ORV damage. BLM has proposed conservation measures to reduce the risks to occupied habitat, but we believe it would be premature to consider these measures sufficiently complete as to remove threats to this species.

Based on this information and observations, we consider the magnitude of the most immediate threat (ORV use) to *Astragalus cusickii* var. *packardiae* to be high. We also consider the magnitude of threats from the presence of invasive nonnative plants that compete with *A. cusickii* var. *packardiae* for resources (light, water, nutrients) and the increased wildfire regime to be high. In addition, because *A. cusickii* var. *packardiae* is endemic to a single location in southwestern Idaho, threat factors as described in this document are compounded by its restricted habitat and small population size.

Imminence:

All of the identified threats to *Astragalus cusickii* var. *packardiae* are currently considered ongoing. The most immediate threat to *A. cusickii* var. *packardiae* and its habitat is ORV use. This threat is currently occurring rangewide and is likely to expand in extent and intensity in the near future. We have therefore determined that this threat is imminent.

Based primarily on the high magnitude and immediacy of the threat from ORV use, as well as threats from wildfire and invasive nonnative species, we have given this subspecies an LPN of 3.

Rationale for Change in Listing Priority Number (insert if appropriate)

Is Emergency Listing Warranted?

No. The identified threats to *Astragalus cusickii* var. *packardiae* are considered high and imminent overall, and the threats to this species are increasing. However, they are not yet high and imminent at all known occurrences. Results from 2010 monitoring data will provide additional information on *A. cusickii* var. *packardiae* abundance and threats since this will represent three years of baseline monitoring. We will reevaluate the status of this species after that information is received.

DESCRIPTION OF MONITORING

As described above, the Service provided funding to Mancuso Botanical Services in 2008 to conduct a rangewide survey for *Astragalus cusickii* var. *packardiae*, and initiate a long-term monitoring program for this species. Monitoring currently occurs at 19 occurrences on BLM and State lands where access is available. Funding is in place for monitoring to be repeated in 2010.

The Service also maintains contact with the BLM and provides the BLM botanist (both at the State Office and the Four Rivers Field Office) with copies of the survey and monitoring reports for *Astragalus cusickii* var. *packardiae*. In addition, we participate in the collection of field data, conduct site visits, and review monitoring reports. We have also spoken with the primary private land owner within the species range. Relevant literature and data for this species are obtained principally from contact with the BLM, Idaho Natural Heritage Program species database, and Mancuso Botanical Services and associated reports.

Given the limited geographic area where this species occurs and the low number of occurrences, we believe the level of monitoring described above is adequate to update the status of the species at this time.

COORDINATION WITH STATES

Indicate which State(s) (within the range of the species) provided information or comments on the species or latest species assessment:

The U.S. Fish and Wildlife Service botanist has obtained information from the Natural Heritage program database in Idaho.

Indicate which State(s) did not provide any information or comments: N/A

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APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve:

Acting Cecily A. Bohan 5/18/10
Regional Director, Region 1, Fish and Wildlife Service Date

Ronan W. Gould
ACTING
Director, Fish and Wildlife Service October 22, 2010

Concur:

Do not concur: _____
Director, Fish and Wildlife Service Date

Director's Remarks:

Date of annual review:

Conducted by: Karen Colson Date: May 4, 2010
Botanist

Reviewed by: Kendra Womack Date: May 4, 2010
Supervisory Fish and Wildlife Biologist

Steve Duke Date: May 4, 2010
Assistant Field Supervisor

Gary L. Burton Date: May 4, 2010
Acting State Supervisor, Idaho FWO